

## Addressing Climate Change

There are two complementary courses of action to address climate change. Good Climate Change planning includes both mitigation and adaptation strategies.

1. One course of action targets the *causes* of climate change and seeks to reduce the amount of greenhouse gases (GHGs) that are released to the atmosphere as the result of human activities; for example, by reducing energy consumption in our homes or vehicles, or reducing the GHG-intensity of the energy we use. This is called climate “**mitigation.**”
2. A second course of action targets the *impacts* of climate change and seeks to enhance our resilience to changing climate conditions, enabling us to better cope with and manage risks, as well as take advantage of opportunities that arise. This is commonly referred to as climate “**adaptation.**”

## Key Terms and Concepts

### ➔ Adaptation (actions)

Deliberate actions by communities in response to current or expected climate phenomena, which moderate potential harm or take advantage of beneficial opportunities. Actions can include monitoring, research and other information gathering, education and capacity building, changes to infrastructure, creating new policies and regulations, developing economic and other incentives, and ensuring governance takes into account climate change.

### ➔ Adaptive capacity

The capability of a community to moderate potential harm, to take advantage of opportunities, or to cope with the consequences from current and expected climate phenomena. The adaptive capacity of individuals, households and communities is determined by their access to, and control over, human (e.g., awareness of climate risks), social (e.g., healthcare), physical (e.g., irrigation infrastructure), natural (e.g., reliable raw water supply) and financial (e.g., savings) resources.

### ➔ Adaptation planning

The collection of participatory activities and steps undertaken to moderate potential harm or to take advantage of beneficial opportunities from climate phenomena.

### ➔ Climate

Climate and weather refer to separate things. Weather describes atmospheric conditions (such as temperature, humidity, precipitation, wind, cloudiness) in a place or region in the short-term—usually, hour-to-hour, day-to-day, and even weeks to months. For example, Medicine Hat may have a particularly hot day, wet week, or warm winter. Climate refers to the average of weather conditions over 30 years or more. When describing southwest Alberta as typically windy, you are describing an aspect of its climate. Weather can change dramatically in a place or region from day-to-day (e.g., hot and dry one day, followed by cold, wet conditions the next day). Climate, in contrast, changes more slowly since it represents the average weather over the long-term.

➔ **Climate change**

A change in climate (average weather patterns) that last for an extended period. Climate change includes significant changes in average annual and average seasonal temperature or precipitation patterns in, say, central Alberta, that persist for decades or longer. Climate change also refers to long-term changes in the variability of climate. Climate change arises from human activity (i.e., greenhouse gas emissions) that alters the composition of the atmosphere, over and above what would be expected with natural climate variability.

➔ **Climate extremes**

Weather extremes viewed over seasons (e.g., drought or heavy rainfall over a season), or longer periods. Weather extremes are individual events that are unusual in their occurrence (at a minimum, the event lies in the upper or lower tenth percentile of the distribution) or have destructive potential, like tornadoes, strong wind gusts, short-duration high-intensity rainfall events, etc.

➔ **Climate phenomenon**

An atmospheric condition or related hydrologic process that results in a specific set of generally known, or characterizable, impacts. Climate phenomena include both (rapid onset) shocks, such as heat waves, drought, lightning strikes, freezing rain, tornados, strong winds, heavy snow, hail, low flows in rivers, short duration intense rainfall, flooding, and (slow onset) stresses, such as changes to seasonal temperatures and rainfall patterns. Climate change may affect the character, magnitude and likelihood of specific climate phenomena occurring in a place.

➔ **Climate variability**

Average weather patterns show variation within short timeframes (e.g., a month, a season, one or more years). For example, this year may be significantly drier than an average year in Alberta, whilst the preceding couple of years may have been slightly wetter than the average year. Climate variability refers to these deviations—or anomalies—from the average. The term “natural climate variability” refers to variability in the climate that is not attributable to, or influenced by, any activity related to humans.

➔ **Co-benefits**

The added benefits of adaptation, over and above the benefits of moderating potential harm or exploiting potential opportunities that arise from current and expected climate conditions. For example, the increased use of distributed energy technologies to provide electricity not only reduces a community’s vulnerability to power outages by diversifying supply, it also reduces emissions of greenhouse gases (contributes to climate mitigation goals) and increases job opportunities (contributes to economic development goals). Co-benefits can often be at least as equally important as the direct benefits of adaptation.

➔ **Community**

A group of Indigenous people who are linked by social ties, share a common identity and geographical locations or settings, and on this basis, engage in joint action.

➔ **Exposure**

Exposure refers to people, livelihoods, buildings, infrastructure, cultural assets, environmental resources and services, etc. being in places where they could be affected by climate phenomena. Communities in semi-arid regions, for example, may be exposed to drought and water shortages.

➔ **Greenhouse gas**

A greenhouse gas (GHG) is a compound found in the Earth's atmosphere—for example, carbon dioxide, methane, water vapor, and other human-made gases. These gases allow solar radiation to enter the atmosphere and strike the Earth's surface, warming it. Some of this energy is reflected towards space. A portion of this reflected energy, however, bounces off the GHGs, and becomes trapped in the atmosphere in the form of heat. The more GHG molecules there are in the atmosphere, the more outgoing energy is trapped, and the warmer the Earth will become.

➔ **Hazard**

A climate phenomenon that has the potential for causing harm to a community.

➔ **Impacts**

Adverse or beneficial effects on communities. For this Guide, impacts result only when a community is exposed to a climate phenomenon, to which that community has inherent vulnerabilities.

➔ **Livelihoods**

The capacity (capabilities, resources, and activities) of a community and its residents to generate and sustain their means of living, enhance their well-being, and the well-being of future generations. Livelihood resources include human, natural, social, physical and financial capital. Livelihood activities include agriculture, trading, formal employment, etc.

➔ **Maladaptation**

Maladaptation describes adaptation actions taken to reduce vulnerability to climate change that increase, rather than decrease, the vulnerability of a community. Maladaptation may occur when actions increase the vulnerability of people, groups or sectors, increase GHG emissions, increase inequity in the community, decrease incentives to adapt, or place limits on the ability of future generations to adapt.

➔ **Mitigation**

An action that will reduce or prevent GHG emissions, such as using renewable energies like wind and solar, making buildings, vehicles and equipment more energy efficient, and walking or cycling from time to time instead of using a car. It can also include planting trees to absorb and store carbon dioxide from the atmosphere.

➔ **Sensitivity**

The degree to which people, livelihoods, buildings, infrastructure, cultural assets, environmental resources and services, etc. could be affected, either adversely or beneficially, if exposed to climate phenomena. For example, newer buildings constructed to the latest code will be less sensitive to strong winds or heavy snow loads than older structures, in need of repair. Furthermore, the elderly and people suffering chronic respiratory and cardiovascular illness, are more sensitive to heat stress than healthy adults.

➔ **Resilience**

The ability of a community to prepare for, resist, respond to, and recover from the impacts of climate phenomena in a timely and efficient manner, with minimum damage and disruption to the environment, and the social well-being and economic vitality of the community. Resilience and adaptive capacity are strongly linked. Thus, different groups within the community will be relatively more or relatively less resilient to climate phenomena, depending on their adaptive capacity.

➔ **Risk**

The expected consequences for people, livelihoods, buildings, infrastructure, cultural assets, environmental resources and services, etc. of exposure to specific climate phenomena. Risk is thus a function of the likelihood of a climate phenomenon occurring in a place and the resulting impacts.

➔ **Vulnerability**

The propensity or predisposition of people, livelihoods, buildings, infrastructure, cultural assets, environmental resources and services, etc. to be affected by specific climate phenomena. Vulnerability is a function of the nature and magnitude of the climate phenomenon to which people, livelihoods, etc. are exposed, their sensitivity to that phenomenon, and their adaptive capacity. Exposure of vulnerable people, livelihoods, buildings, infrastructure, cultural assets, environmental resources and services, etc. to climate phenomena gives rise to impacts.